Effects of dust formulations of three entomophatogenic fungal isolates against Sitophilus oryzae (Coleoptera: Curculionidae) in rice grain

ABSTRACT

Three isolates of entomopathogenic fungi were evaluated as dried conidia against the rice weevil, Sitophilus oryzae. Based on the steepness of the gradients and supported by low EC50 and EC95 values, the test for pathogenicity indicated that the isolate of Beauveria bassiana (BbGc) was the most infectious against the rice weevil adults. Admixtures of the isolates BbGc and BbPs with either kaolin, talc or tapioca flour (20 % w/w a.i.) applied at the lowest rate of 0.05 g a.i. and thoroughly mixed with long grain rice in plastic cups (8 cm diameter by 5 cm high) resulted in excess of 80% mortality to the adult weevils by the 7th day of exposure. In comparison the admixture of Metarhizium anisopliae (MaPs) applied at the same dosage gave lower percentage mortality of the adult weevils. Fungal formulations in kaolin and talc provided better protection against the rice weevil by giving significantly better kill compared to those formulated in tapioca flour or the unformulated control. When applied at the rate of at least 0.1 g a.i. in 50 g rice grain, kaolin admixtures of all the three isolates consistently gave the highest kill; for example BbGc in kaolin gave significantly 98.75% mortality 7 days after treatment. Generally, admixtures of the test isolates formulated in tapioca flour provided poor protection of the rice grain; a significantly higher grain weight loss was recorded compared with that of kaolin or talc after 4 months of storage.

Keyword: Entomopathogenic fungi; Admixtures of dust formulation; Rice weevil; Grain weight loss